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Six Sigma Methodology applied to Immediate Use Sterilization at Thomas Jefferson University Hospital

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Immediate use sterilization, also known as flash sterilization, is an expedited sterilization process used for surgical equipment needed in emergent clinical situations. Immediate use sterilization is a procedure used by Operating Room staff members to sterilize instrumentation on an as needed or just in time basis when instruments needed for a particular case are not immediately available or become contaminated in the course of the case. If instrumentation is not sterilized appropriately, the patient's safety is possibly put at risk from the potential of surgical site infections. No specific literature data directly correlates immediate use sterilization with surgical site infection. However, eliminating this variable enables infection control to focus prevention efforts elsewhere.

Immediate use sterilization can be misused or over utilized to compensate for lack of adequate inventory, inefficiencies in sterilization workflow or for staff convenience. It is a process deemed by the Joint Commission, to be fully documented, monitored closely and avoided when possible.

In July 2010, Thomas Jefferson University Hospital, Inc. recognized the need to reduce the utilization of immediate use sterilization. Expected benefits of decreasing the rate included:

- advancing quality and safety for patients,
- improving regulatory compliance,
- improving operational efficiencies,
- improving staff and physician satisfaction,
- decreasing operating room (OR) turnaround time, and potentially reducing the risk of surgical site infections.

To reduce the rate, Jefferson charged an interprofessional team consisting of Six Sigma Belts, and clinical experts including, Infection Control, Operating Room staff, and Sterile Processing. The team was comprised of staff members who were

identified as stakeholders in the process by leadership. The initial challenge for the project was to establish a recognized method to define and capture the immediate use sterilization rate among its many operating rooms and procedural areas.

Upon standardization of the methodology, a baseline immediate use sterilization rate of 15.65% was calculated for TJUH, Inc. This meant that an average of 15.65% of the Operating Room cases had instrumentation that was sterilized by the immediate use sterilization process in a four month period. Based upon the six sigma methodology, the goal was to decrease immediate use sterilization by 90% to a 3.6 sigma level and ultimately an immediate use rate of <1.565%. Taking into consideration further reduction opportunities that require capital expenditure, the Project Sponsors set the goal to <5% for this project to be considered a success.

The interprofessional team worked through the five phases of Six Sigma methodology: Define, Measure, Analyze, Improve and Control (DMAIC). The methodology focuses on quality measurement, processes for continuous improvement, and enabling culture change. The culture change, or people side of change, is often the most challenging and critical component of an organization's transformation. For this project, this was also true. The process was comprised of staff from two areas of the perioperative division - operating room and sterile processing. While the staff in these areas was dependent on each other, there was no forum to discuss the current process or identify opportunities for improvement. A requirement for project participation was to meet weekly as a team for a minimum of two hours. During these meetings, the belt facilitators ensured that every voice was heard and that every idea was considered.

Six Sigma is rooted in statistical analysis because it is data-driven and is a strict approach that drives

process improvements through statistical measurements and analysis. This approach led to objectively viewing opportunities for improvement and enabling potential solutions to be created by all team members from the analysis completed of the entire process.

This approach also takes time, effort and a strong collaborative team. Through their dedication and collaboration, this interprofessional team achieved the following success:

- Standardization of the immediate use sterilization log across campuses
- Standardization of the rate calculation across campuses
- Establishment of base rate for the Jefferson organization
- Establishment of the express cycle for the main surgical locations
- Revision of policies – immediate use sterilization, express cycle
- Staff education
- Improved collaboration between sterile processing/case cart and the operating rooms through daily huddles
- Identified immediate use instruments sterilized a high percentage of time
- Identified resources to secure purchasing of highest immediate use sterilized items
- Compliance and regulatory benefits
- Reduced exposure to possible non-sterile instruments
- Possible dollar savings from time saved in immediate use sterilization for OR nurses
- Removal of dirty decontamination from clean OR

By October, 2011, the team had reduced the immediate use rate to 2.8%, an 82% reduction from the established base rate. Recent analysis shows the team sustaining the improvement, reporting 2.7% for December, 2012. Beyond standardizing immediate use sterilization and the rate across campuses, the project's greatest success was in improving teamwork, collaboration and respect among the various stakeholders. This collaborative effort continues and, along with greatly reduced immediate use rates, will be the true legacy of the project among the various stakeholders.

Immediate Use Sterilization Team: Beth-Ann Schauer, MBA, PMP, SSGB; Lori Szymonowicz, CPAM, SSGB, Precil Varghese, PharmD. SSBB, Kevin Plews, BS, BSN, CCRN, SSGB, Richard Webster RN, MSN; Phyllis Flomenberg MD; John Ervin, RN, BSN, MBA; Diane Wolk MSN, RN, CNOR; Kenneth Szajdek; Lizanne Mason, BSN, RN; Joanne Grace MS, RN, CNOR; Eleanor Kelly MS, RN, CNOR; Ronald McMonagle; Theodore Wheeler, BS; Bryan Esham; Dennis Kosar